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UNITED STATES
FEDERAL COMMUNICATIONS COMMISSION

In Re Applications of:)
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PUBLIC FORUM OF TRANSMISSION)
CAPABILITY BETWEEN THE)
CENTRAL OFFICE AND END-USERS)
IN NEXT-GENERATION NETWORKS)
AT WASHINGTON, D.C.)

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Before the
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Washington, D.C. 20554

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Commission Meeting Room
FCC Headquarters
455 12th Street, S.W.
Washington, D.C.

Thursday,
March 29, 2001

The parties met, pursuant to the notice of the Commission, at 1:03 p.m.

BEFORE:

P R O C E E D I N G S

(1:03 p.m.)

MS. ATWOOD: Okay. Why don't we get started. I just want to briefly thank you all for coming here today. Our Chairman, as you know, is presently testifying today on the Hill as we speak. I guess you guys got the short stick, but this forum is quite consistent with his vision that we improve our technical understanding of networks so that we develop sound public policy on the basis of complete and accurate information in the face of all of the changes that are happening in technology.

Specifically here today, the goal of the forum is for the Commission to gain further understanding of a technical nature in the way the transmission from the central office to the end-user occurs within the context of next-generation architecture.

The questions presented are really designed to elicit information on three main categories of issues. First, the transmission capability within the next-generation architecture. Second, clarification of the function of each piece of equipment within these networks and, finally, we have -- we want to try to address a few associated items such as testing, maintenance and OSS for the next-generation architectures.

Now these issues have arisen at several

proceedings before us and we recognize that we need to move forward and try to resolve some of the issues that have been presented and understand the correct regulatory framework.

But I just want to underscore today that our focus is on the technical issues presented, hence why we have the technical experts here, and not on the legal and public policy questions that emerge from that.

In fact, I just want to make very clear that we're not going to discuss the legal and policy questions because you all have -- or most of you who are here -- have been advocating and presenting voluminous information to us in the context of the pending proceedings and in those comments we'll resolve some of the broader public policy questions, but we're here today to focus on the technical.

So we're going to try to really stick to that and to the extent that we ultimately have to be rude and cut somebody off if the advocacy becomes -- strays to that side, understand in advance that it's not you, it's really just what we're trying to focus on here today.

Now we are transcribing this forum so it will be available as a matter of public record. With that said, I think it would be useful if we just preliminarily wandered around the room of the folks who are at the table and if you could introduce yourself and explain where you're from and a little bit of your background it would be very helpful.

Why don't we start here?

MR. GERTZBERG: My name is Irwin Gertzberg. I'm with AT&T. I've been with AT&T for almost 24 years now doing a variety of local access-type initiatives.

My organization at AT&T has responsibility for the local access technologies, the digital carrier, the voice over DSL, any of the local technologies that are really being discussed today, fall into my organization within AT&T.

MS. ATWOOD: Great.

MR. REISTER: Yes. I'm John Reister from Copper Mountain. We're a DSL manufacturer and we provide a lot of equipment to many of the competitive carriers out in the network today. I used to work at Pacific Bell and came over to Copper Mountain from there. I do technology strategy for Copper Mountain.

MR. ORREL: Hello. My name is Barry Orrel. I work with Quest. I've been there for about 22 years now. My capacity is as a director or a technical regulatory group where we develop interconnection strategies associated with various access technologies.

MR. RANSOM: Hello. I'm Neil Ransom. I'm the CTO of Alcatel USA. Alcatel produces the light span digital carrier system, which is the more popular of the digital carrier systems. Also, we're a major supplier of ADSL

equipment. So Alcatel's heavily involved in the areas under discussion today.

My background, I have been with Bell South and with AT&T Bell Laboratories.

MR. McNAMARA: I'm Bill McNamara. I'm with Bell South. I've been with Bell South since it was born. I have responsibility for the evaluation and selection of access and transport products for Bell South including DSL-type products.

MR. SACKMAN: I'm Jim Sackman. I'm CTO for Advanced Web Communications and I've worked with the industry in both datacom and in telecom for about 18 years.

MR. BOLTON: I'm Gary Bolton. I'm vice president of Product Marketing at Catena Networks. Catena Networks is a privately held company. It's in business for about two years and it's a very R&D intensive company that's mission is to integrate voice and DSL to make broad band ubiquitous. I've been in the industry for about 18 years with about 16 of that at Nortel.

MR. JEFFRIES: Hi. I'm Ron Jeffries from Occam Networks. We're a start-up equipment provider in this space. I've been with Occam since the beginning. We're very interested in this technology.

MS. DAVIS: Hi. My name is Carol Davis and I'm here today representing Sprint. I currently have

responsibilities in the area of our CLEC arm of the business. However, I have an extensive experience in both outside plan engineering and network switch and transmission planning on the ILEC side.

MR. LUBE: Hi. I'm John Lube. I'm representing SBC. Specifically, I'm representing the CLEC within the SBC family of companies. I've got various network and regulatory job experience for a little over 30 years with SBC and, specifically, I'm in the group that handles what we refer to as network advocacy and regulatory proceedings.

MR. KIEDERER: I'm Charlie Kiederer with Verizon Communications. I'm in the technology organization in Verizon. I have 30 years experience in various areas of technology at Verizon and its predecessors, Bell Atlantic, Nynex, New York Telephone. I currently lead a team that provides the technical support to our wholesale services marketing organization.

MR. MORGAN: I'm Kevin Morgan with Adtran. We're an equipment manufacturer that provides solutions for the local loop as well as carrier service providers and enterprise networks.

I've been in the communications industry about 15 years and my responsibilities at Adtran are for product management and product development and local loop solutions.

MR. EDHOLM: I'm Phil Edholm for Nortel Networks.

Nortel is a manufacturer of telecommunications equipment, much of which is used in advanced next-generation networks. My responsibilities are in the technology area of enterprise and access.

My background is primarily in the networking industry coming out of the other side of the world from things like ethernet and IP. So a little different background.

MR. DRAKE: I'm William Drake with WorldCom, Incorporated. I work with the global access, technology and development group evaluating new technologies for local access.

MR. REILLY: David Reilly with Rhythms. I'm a network engineer with Rhythms concentrating on the layer one aspects of DSL and represent Rhythms at T1E1 and Enrich.

MS. ATWOOD: Well, thanks a lot. I think now I'd like to introduce the FCC staff, both -- this forum is sponsored both by the OET and by the Common Carrier Bureau and I'd like to introduce the staff. They will actually take it on from here.

Now you all have gotten advanced copies of the kinds of questions that we're going to ask and when we go through the questions if you -- I think we don't have a specific format in the sense of who we're going to call upon to answer the question first, but if you feel that you have

a burning desire to be the principle person or at least the starting person please make yourself known as we go through the questions. Now I'm Dorothy Atwood, chief of the Common Carrier Bureau.

MR. STANSHINE: Jerry Stanshine, Office of Engineering and Technology.

MR. GUPTA: Shanti Gupta, Office of Engineering and Technology.

MS. ROSENWORCEL: Jessica Rosenworcel, Policy Division of the Common Carrier Bureau.

MS. FARROBA: Kathy Farroba, Policy Division of the Common Carrier Bureau.

MR. McDONALD: Rodney McDonald, Network Services Division, Common Carrier Bureau.

MS. FARROBA: Okay. All right. Let's start with question number one. Just for the record, since we're transcribing it, that question is whether the equipment and the terminal hardwired to the serving area interface/feeder distribution interface or whether it is hardwired?

If so, how would a carrier with stand-alone equipment collocated inside a remote terminal access and individual copper pair that has been hardwired to that serving area interface fiber distribution interface?

It might be helpful maybe to start with some of the equipment manufacturers first.

MR. RANSOM: All right. I'm Neil Ransom at Alcatel. The digital carrier system -- the interfaces to the customer doesn't occur typically at the digital carrier system itself but, rather, at remote points called the FDI or feeder distribution interface.

The reason is in order to be economic it's important to have a large size digital carrier system, but on the other hand, you want to save as many pairs out towards the customer and provide concentration between the distribution pairs and the feeder.

So the compromise for that is to have a centralized digital loop carrier system that's then connected with feeder cables to the FDI point which is located closer to the customer and that's where the connector blocks are that allow connections to individual pairs.

At the digital carrier system these feeder interfaces connect to what are called block connectors that then terminate in typically 25 pair blocks onto the digital loop carrier system itself.

So to then answer the next question, well, what happens if you have additional equipment at the digital loop carrier site that you need to gain access to individual pairs? We've run into that, of course, with trying to offer DSL services to an existing digital loop carrier system.

One solution that's been used is to get access through the protector blocks. There are at the digital loop carrier systems, protectors to handle over-voltage lightening-induced occurrence on the lines. Those do have individual protectors and it's possible to remove those protectors and connect other equipment, that is presuming that, that other equipment provides the protector function that's formed there.

Now I also will mention that in some deployment -- and this will vary from one network operator to another -- some will put an FDI next to or collated with the digital loop carrier system, although that typically wouldn't be for all pairs but just to handle those distribution pairs which happen to be physically located where the digital loop carrier system is. Then the other ones are connected remotely. So that's the major answer. Thank you.

MR. BOLTON: Let me just -- this is Gary Bolton with Catena Networks.

Let me just add to what Neil just said, is that basically to provide access now to an overlay piece of equipment like a DSLAM you would have to have what they call trombones. So you would have to add this new connector block. You take the -- go in to the protector block with a patch cord and provide that to a new connector block and then be able to trombone. Take that twisted pair, to the

DSLAM into a POTS splitter and screen off the data and return the POTS back to the connector block and then back into the voice transport.

So what you've done is you've, in essence, significantly increased the complexity because now you have a number of different wires, you've added new blocks to be able to terminate all these new wires and you now have added POTS splitters and lengthened the loop.

So now to do POTS splitters you have to be able to test around that POTS splitter because you have a low pass filter and a high pass filter and so you lose access to the full spectrum of the loop. So it's added a lot of complexity to the installation.

If you look at a remote terminal site, you know, you are very constrained with power, space and density issues. So you're adding cable congestion, which damages air flow through the cabinet, so that increases your heat dissipation. You're also adding a lot of complexity with being able to have more termination.

So now when a craft goes out to the field to be able to terminate all these extra wires, you add errors, so it's very error-prone. So there's a lot of operational complexity.

On the other side, just to kind of segue from here, if you are to go to like an integrated approach like

the SPC, deal with the project waiver, you just basically insert a simple line card that has CD SLAM capability and the POTS capability and you would have no extra wire at all. So basically it's just a very simple process.

MR. LUBE: Yes. This is John Lube with SBC again. I might add just a couple of thoughts to what's already been said. I think most of what has been said is dealing with ways to access small numbers of pairs on an after the fact basis. I agree with all the operational issues that were described as being potential problems.

But to look at it from even another angle, if you're contemplating whether it's a good business decision or a good economic decision to pre-equip an entire RT location within the RT structure with full cross-connect capability for all of the pairs or all of the -- I guess you would call them the feeder pairs -- that come out of the DLC itself, that we see in SPC is not being the right thing to do.

We generally have not done that and not only for reasons of space and all the extra cost that it would take to pre-equip the entire line capacity of the RT with a cross-connect access, but you also have -- even with that you have maintenance issues in that you have to have your technician trip to another location on a service order basis to run another jumper.

Right now the technician trips to the feeder distribution interface in most cases to place a cross-connect. If you put a full cross-connect field in an RT as well for the contemplated purpose perhaps of giving other carriers access to those pairs, right there that does create that additional location where a technician has to trip.

You also have what we call hands in the plant. You have more technician hands in and around the plant which is a potential cause of service problems.

So for all of those reasons we just -- we just want to emphasize that we don't think the pre-equipping of an entire RT is a viable approach for ILEC to deploy with DLC.

MR. SACKMAN: This is Jim Sackman.

One thing that you should note and that has probably not been noted yet is that they usually over-subscribe the feeder pairs four to one. So the distribution to a 2000 line neighborhood has usually got two 672 wires running to the DLC and the rest of the pairs are stranded on the cross-connect that usually sits next to it.

MR. McNAMARA: Let me say something here. I'm Bell South, again. We probably have more experience in dealing with service from RTs than --

(Pause.)

I think we have more experience with dealing with

ESL out of RTs than anyone else. As of this point in time I believe we have over 5,000 RTs equipped with ADSL capability.

We have not deployed ADSL on any multi-service platforms yet. We're looking hard at it. We're looking hard at the economics and believe that we probably will do it sometime in the near future, but we have not been able to afford to wait for that capability. So we've actually been deploying DSLAMs at remote sites, typically in stand-alone cabinets and we've had to deal with all of the issues that have just been alluded to.

Our first choice for interconnection -- for relatively small line sizes -- is using the protected panel and the connection methodology. We believe it's viable for up to probably 200 ADSL interconnections, only if it's done very carefully because it becomes a rat's nest very quickly.

The second choice is terminating those lines on a co-located FDI if there is, indeed, a co-located FDI. If there is, then you wind up using this FDI for a purpose it was never intended for and that is, effectively, as a cross-connect panel. But it's considerably better than the alternative.

The third choice is actually to do a hard splice where you interconnect all of the ADSL capacity to a defined subset of the DLC capacity and then interconnections become

a line of station transfers, a fairly complex process that's prone to making some mistakes.

But we have dealt with this fairly effectively. We have gotten our success rate on first attempt turn ups pretty high. We've learned some lessons in the process, but we believe it is, indeed, possible.

So far as co-locators interconnecting to our existing DSL capacity, the methodology would be exactly the same and we'd use exactly the same suite of choices, from patch panel first to cross-connect panel second to hard splice as a third choice.

We have, indeed, considered the unit position of dedicated cross-boxes. It's extremely expensive. It's a one-time charge of at least $10,000 plus all of the additional service problems at the unit position that such a box can cost.

MS. FARROBA: Actually, can I sort of build on the discussion? You mentioned three possibilities for how you would I guess access the individual copper pairs, one is a patch panel and then the cross-connection solution and then the hard splice.

What I'd like to know is what's actually going on out there in the networks today as far as which of these methods are being used by the carriers? I realize you were speaking on behalf of Bell South. If you have additional

remarks that would be great, but I'd also like to hear from Quest and SBC and Verizon.

MR. McNAMARA: We use all three.

MR. KIEDERER: Charlie Kiederer with Verizon. We do not have the kind of implementation of DSL in the remote terminal environment as our friends at Bell South do.

We have, however, looked at the issue. The alternatives that were described are certainly some of the alternatives that we looked at. There is another alternative which would be potentially adding some additional cabling, copper cabling, to get from whatever equipment is collocated to the FDI, certainly to the degree that if the FDI is located at or near the RT, that would simplify that task to some degree.

I hesitate about using the protection blocks, although Bell South seems to have experience with that, and we haven't, but those are there for a purpose: to protect the electronic equipment inside the remote terminal. They're put in as part of the National Electrical Code and we wouldn't want to see a whole lot of tampering with that.

You'd have to look at that, in any event, on a site-specific basis to determine how many pairs are you actually using, are there spare pairs in the feeder complement, and then -- I don't know where Bell South is on this, maybe they can address it, but certainly there's an

implication of how you keep track of all that stuff at that point since it's not typically a cross-connection point in the network.

MR. ORREL: Quest, their current deployment schedule -- we're actually in the process of building out a remote capability for our DSLAMs.

Quest looked at all of the alternatives that we've discussed here and our approach has been to actually deploy separate cabinets at the FDI or very near to the FDI to house our DSLAMs and provide cabling from that remote terminal where the DSLAM is to the FDI to utilize the FDI as a cross-connect field, as originally was stated earlier, not intended to be a cross-connect point but over the course of time with subloop access, etcetera, it has become just that. It's the natural point for access to the distribution subloop.

From our business perspective, our business plan perspective, it made the most sense to deploy the DSLAMs as close to the customer as possible. Not in all cases is the DLC RT right next to the FDI. So from the perspective of trying to provide as much capability to our -- for our customers as possible and eliminating some of the issues that others are running into, around trying to provide access at the protector field and the RT, which definitely is not a standard access point for loops or subloops. We

chose to place them at the FDI.

A PARTICIPANT: Are they cross-connected at manual cross-connect?

MR. GUPTA: Electronic cross-connect.

MR. ORREL: At the FDI in Quest territory in their ILEC region it's a manual cross-connect.

MR. GUPTA: Which one?

MR. ORREL: Manual.

MR. GUPTA: Is there any reason why you didn't follow the electronic cross-connect? Because that will become -- for instance, it will become much easier later on?

MR. ORREL: Well, the primary reason is we're accessing FDIs that already exist. These in already developed areas. The cost associated with retrofitting in providing this extra space required for the electronic cross-connect just didn't justify or cost justify in this case.

MS. DAVIS: Carol Davis with Sprint. I suppose Sprint has been on both sides of this issue. From our local division predominately we place the cross-connect next to the digital carrier. So the copper parents is at that location in most cases. So from that side of the business it does truly simplify access to the copper subloop. We've also had some experience with that issue being the CLEC in trying to gain access to subloop.

One of the issues that has arisen in our experience is gaining access to subloop. We're finding that in many cases we have been limited to access to vacant copper pairs. That access is fine if you intend to do data only and the customer wants two lines into their house, but if you're going to do line sharing then you truly require access to the loops that are even being served by the incumbent.

So then the need to line share also has to be accommodated, which having a cross-connect nearby the digital loop carrier can do that.

However, I believe that in some cases depending upon the housing that the digital loop carrier is in -- for instance, if there is a controlled environment vault you don't have as many operational issues involved in making a termination.

Truly many companies have sought to separate the craft technicians. Typically there have been different grades of technicians that work on electronics than the folks that do the splicing. So they've tended to segregate those two parts of the business.

But access could be made in a controlled environment that would be near a mainframe type application that would allow access to all of the subloops leaving that location.

So it's a mixed bag. It depends -- it's a case by case basis. But there are alternatives.

MS. FARROBA: Mr. Lube?

MR. LUBE: Yes, thank you. I've got several different comments related to the different things that have been recently said.

I, too, would say that we would hesitate to use the protector block for the reasons that Verizon was describing to provide this type of subloop access within an RT structure.

Another thing I'd like to mention, I guess there was some comments -- I'm not sure by whom -- about putting the cross-connect box very close to the RT site, maybe like in an adjacent FDI cabinet.

I can't speak for the other ILEC networks, but I know that at our network there's usually multiple FDIs that are served out of each RT, maybe four, five or six of these. They're generally in different directions out from or away from the RT site itself.

So assuming that a carrier wanted to access customers that are served out of each of those different FDIs, again, there's got to be some kind of scheme for that carrier to be able to access them all.

So I guess what I'm saying is the RT is not -- in our network the RT is not collocated, so to speak, or

located nearby all of our FDI cabinets. It could not be.

I might also mention -- and Bell South can correct me if I'm wrong -- but I think the experience that they've got by doing this type of access within the RT is related to their large-scale use of remotely-located stand-alone DSLAMs in the RT.

I guess within the SBC ILEC states our separate data affiliate does not use that type of approach. Our separate data affiliates use the integrated project pronto architecture, the DSL-capability NG DLC. So they don't need to put a DSLAM -- stand-alone DSLAM at the RT, so we don't have that type of experience.

There have been very few -- maybe extremely few -- carriers that have come to us asking to put their DSLAM -- other carriers, I should say, unaffiliated carriers, that have come to us asking to put their DSLAMs, their stand-alone DSLAMS, in our RTs, which I must admit is kind of surprising because last year there was a lot of discussion from some of the carriers that they wanted additional space to do that.

In fact, SBC's spent tens of millions of dollars upsizing CEVs and HUTs for that very purpose and we've not had any takers to utilize that investment, that additional investment.

But what we do propose for a carrier that would

like to do this is we propose -- we have available several different methods of access to the subloop that they could use. Probably the most obvious is a direct cabling type of access to each FDI.

The carrier, the CLEC, would run cable over to the FDIs that it wants to access to serve customers. We would terminate those cables in the FDI for them and run the jumpers there for them as they needed to use those subloops that they were going to access.

But we also have something that I'm sure most folks have heard of through what we call the pronto order that the FCC issued last September, and that's the engineering control splice which will actually afford the CLEC the opportunity to request for less, a specific physical cross-connect capability, a device to literally do physical cross-connects at or near the RT site giving them the access to every FDI that subtends that RT. So there are those kinds of options that we offer.

I know I've been talking a whole lot here and I beg your indulgence for one more minute. I know that the purpose of this whole panel and this meeting and this forum today is to address technical issues. I would like to make just a quick comment about that.

From a network perspective and from a technical consideration perspective, I have to tell you that it is

very difficult if not impossible to separate the technical issues from the policy issues. I know we're not going to talk about policy issues, but I just want you to appreciate the fact that our network --

MS. ATWOOD: You can skirt around the edges in this case.

MR. LUBY: Well, actually I just want you to know though, for us to deploy a type of equipment or a type of technology in our network as a technical decision, as an engineering judgment decision, it cannot be made in a vacuum. It will be made understanding the policies used by our -- that are implemented by the Commission with respect to how it regulates all the different types of broad-band technology that are out there including cable modem and satellite and fixed wireless, you know, vis-a-vis what's being looked at for ILEC networks.

MS. ROSENWORCEL: If I could just quickly return to what you said before. Have any CLEC's taken advantage of engineering control splice that you're describing?

MR. LUBY: My personal understanding is we've had one that's taken advantage of it and I'm not sure how many locations, but I believe there's been one.

MS. FARROBA: Go ahead. Then I have a follow-up question.

MR. KIEDERER: Yes. I just want to follow-up on a

couple of points made by both Carol and John.

Carol mentioned the fact that you needed to look at the specific environment that things are in and that it is possible to do things in some environments that you may not be able to do in others.

I think that something to point out here is that especially in the outside plant environment almost every situation is unique. You're dealing with different things. You're dealing with different environments. You're dealing with CEVs, with huts with cabinets. They all have different issues that need to be solved if you're going to go in and try and change something in there.

So we need to be careful that we don't try and over-simplify what we're trying to do here in terms of coming up with a solution that we think is a single solution to all aspects of what we're trying to solve because that's not going to happen. We need to look at things site-specific.

In terms of the cross-connections inside the CEV, again that Carol mentioned, that certainly could be, you know, a possible option. But I think we also have to be careful. We as engineers when given a problem to solve we can solve it. You know, given enough time and money technically you can probably solve almost anything.

But at some point in the process, we get yanked

back into economic reality and that is, it may not be worth spending the money to do this.

My colleague, John, mentioned what they were doing with their CEVs and the money that they were spending on providing additional space that at least for now it seems may be going wasted.

MR. FARROBA: Well, let me just throw this question out there first. On the different options, it sounds like the FDI and the patch panel are being used almost like intermediate distribution frames, but no one's really talked -- I don't think about actually having a separate intermediate distribution frame not using the patch panel or the FDI especially to the extent that the FDI is not located actually in the RT.

So I wanted to know your thoughts on actually I guess having an intermediate frame right there inside the RT that's not really the protection blocks and isn't the FDI, especially in the architectures where the FDI are located, there are multiple FDI per remote terminal?

MR. LUBE: Yes. I believe the type of device that you're talking about is very much like what we're referring to as the engineering control splice. It is a separate device. It's not the protector block. It's not the FDI. It's a separate cross-connect -- physical cross-connect devise that's added to the network.